

PERCEPTION OF FEMALE STUDENTS ABOUT FREQUENT TESTING ON SOME SELECTED PHYSICS CONCEPTS

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ABSTRACT

This study investigated the perception of Senior High School Female Students on students on effects of frequent testing on attendance, anxiety, study habits and knowledge retention in Physics lesson. Four research questions were raised and analysed for possible perceptions of students on frequent testing. Survey research design method was employed. Self-reported data were collected from 50 second year female students from Accra Girls Senior High School using a 5-points Likert scale type structured questionnaire. Quality control measures such as the need for independent completion of the questionnaires and freedom of participation or withdrawal from the study were strictly followed. Special efforts were also made to minimize methodological, personal and social desirability biases. Data was analyzed using descriptive, T-test and ANOVA statistics. The results of the study revealed that frequent testing increases class attendance, anxiety, study habits and knowledge retention of students. This study concluded that frequent testing has statistically significance positive effects on Senior High School female students' classroom attendance (mean value: 3.8200, SD = ± 1.35870, $p < 0.05$); study habits (mean value: 3.9100, SD = ± 1.18998, $p < 0.05$); anxiety (mean value: 3.0300, SD = ± 1.36667; $p < 0.05$) and knowledge retention in Physics (mean=3.8600, SD = ± 1.27144, $p < 0.05$). The study recommends that physics educators should adopt frequent testing measures to bring positive effects on Senior High School female students' attitudes and performance in Physics.

Keywords: Female Students, perception, Frequent Testing, Attendance, Anxiety, Study Habits, Knowledge Retention, Physics Concepts.

1. INTRODUCTION

A learner-centric technique supports the perception that students should be active members of a class, and this has been a new approach to physics courses (Tosuncuoglu, 2018). In this vein, frequent tests in the classroom are used by physics teachers to check students' acquisition levels. It is common knowledge that frequent tests provide an opportunity to measure the performance of students' academic work. In their view, Meyer, Davidson, McKenzie, Rees, Anderson, Fletcher and Johnston (2010) posited that frequent testing is pivotal for the existence of academic work in educational institutions.

Frequently testing students at the right time and in the right proportions, according to Oncul (2017) has a valuable contribution to make in assessing students' proficiency, progress, and achievement. Lahey (2014) reported that frequent testing as a very effective educational tool is being thrown out with educational bathwater, hence students must be tested more, not less.

Notwithstanding, Berry (2010) argues that testing can evoke negative memories for learners such as being anxious and above all fearing failure and worrying about what others may think of their abilities. These negative perceptions may affect performance to a great extent. But

Leavitt (2010) pointed out that this could only materialize when enrolling in a course where there is only a midterm and a final test. This is because if a student fails or does poorly on the midterm test, then an outstanding performance on the final test is his or her only chance of passing and this would lead to Berry's assertions and a lot of cramming of concepts.

However, research (Vaessen et al. 2016) has shown that these assertions can be reduced greatly, most especially when multiple smaller (frequent) tests are deployed, each counting towards the final grade (Holmes, 2015). A widely held view of frequent testing essentially likens a good test to a mirror. When held up to a student, it faithfully reflects his or her knowledge and skills back to the test administrator. It is true that testing reveals what we do and do not know, with some limitations. But unlike a mirror, frequent test also changes what we know (Benjamin & Pashler, 2015).

Classroom quizzes are useful for evaluating cognitive learning in the course of content. Its potent effect lies in what the scholars call "effortful retrieval" (Srivastava, Mishra & Waghmare, 2018). Roediger and Karpicke (2006), as cited in Grieving and Richter (2018) also indicated that potency of testing is superior to restudying the learning material. This finding, the authors called testing effect or retrieval practice effect. These authors intimated that superiority of testing compared to restudying might not be detected until later when multiple smaller (frequent) tests are deployed. Because of this latent effect, testing or retrieval practice is sometimes regarded as a desirable difficulty (Bjork, 1994 as cited in Greving & Richter 2018). Desirable difficulties are defined as learning occasions that may hamper learning in the short run but enhance learning in the long run (Greving & Richter, 2018). Testing students frequently do not just test a person's knowledge level but it also affects that level. This effect according to San (2016) is also called testing effect. This author established that the less one uses a piece of information, the further back in the memory the brain will stuff it, and it may take quite a bit of effort to pull it out again. This implies that if students are tested less frequently they tend to easily forget the concepts being taught and retrieving the information becomes very difficult.

It appears that frequent educational testing has been a popular topic of research since the early 20th century. Frequent testing studies (Smith & Weinstein, 2016; Kleeman, 2012; Gooblar, 2014; Benjamin & Pashler, 2015 and Adkins & Linville, 2017) in other areas highlight the benefits of frequent testing, while some findings (Lahey, 2014; Adkins & Linville, 2017; Zarei, 2015; Gholami, 2013 and Alade & Kuku, 2017) suggest several drawbacks. However, scholars rarely discuss it in the field of physics especially the perspectives of female students on regular physics test. This study therefore sets out to investigate the effects of frequent testing in Physics concepts as perceived by Senior High School female students.

The study addressed four research questions which include:

- (1) What are the effects of frequent testing on female students' physics class attendance?
- (2) What are the effects of frequent testing on female students' study habits in physics class?
- (3) What are the effects of frequent testing on female students' anxiety towards physics class?
- (4) What are the effects of frequent testing on female students' level of retention of concepts in physics class?

2. LITERATURE REVIEW

The empirical literature reviewed covered the following specific areas: class attendance, establishment of study habits, level of retention and level of anxiety.

2.1 Class Attendance

The general consensus among most faculty members is that regular attendance to class helps students learn more effectively and maintain the substance of the course. According to Park & Kerr (1990), as cited in Sheridan (2012), research demonstrated that the lack of attendance was statistically significant in explaining why students received a poor grade. However, one main technique, according to this author to improving students' classroom attendance is the use of unannounced frequent test. This will encourage students not only to study for each class and have basic understanding of concepts but will also boost class attendance especially when it is made clear that the quizzes cannot be made up later by absent students. Carey (2013) also opined that grading students on test, given at the beginning of every class, rather than in midterms or a final test increases attendance. Smith and Weinstein (2016) added that frequently testing students would increase classroom attendance. This, they said may be more relevant to high schools where attendance may be a problem. These authors explained that when in a class where tests are frequent, students need to be in class in order to take the test and more often come prepared for class. In addition to coming to class, students may pay closer attention to the material when they are expecting to be tested

2.2 Establishment of Study Habits

During school years, most of us got used to spending hours cramming the night before a test. We probably read over and over through our notes, a bag of coffee in hand, hoping the knowledge would stick in our brains somehow. Once the examination was over, we forgot all completely, without hesitation. If students know they are going to be regularly tested (say, once a week or even every class period), they are going to study more and space their study throughout the term, rather than concentrate it just before the exams, Leeming (2002). Gooblar (2014), was also of the view that regular tests ensure that students are studying regularly throughout the term, not waiting until just before the big examination to relearn everything at once. This type of learning advantage for information repeated in a distant manner is commonly referred to as the spacing effect (Carpenter, 2014).

2.3 Level of Test Anxiety

Test-taking has always been a part of every student's life, from elementary till the time they gleefully toss their high school graduation caps in the air, it is likely that students will have taken over one thousands of tests. For many students, test-taking can be frightening, confusing, nerve - wracking or all of the above. Research (Mashayek & Hashemi, 2011) has shown that highly test-anxious students are found to perform about 12 percentile points below their low-anxiety peers. According to these authors, test anxiety is strongly associated with poorer study habit and poorer test-taking skills, which follow from reduced confidence and low morale. A study conducted by Ahsan and Kumar (2016) highlighted that there is a correlation between study habits and test anxiety; that is academic performance will get affected negatively because of the high level of test anxiety and poor study habits. According to these authors, test anxiety is the mental distress and fear experienced by students when they have to face examinations of any type (or) any of its related activities.

With a good study habit (spacing effect) coupled with frequent testing, teachers can help reduce students test anxiety. As mentioned above, frequent test is a good way to improve self-image, but also help students reduce anxiety. Mashayekh and Hashemi (2011) explained that frequent tests are the most proven, yet least used way to establish a good study habit for tests to reduce anxiety. Lentz posited that with frequent tests, students are given a chance to see their areas of weakness and strength. The students also get a look at how a test may be organized, enhancing their confidence and reducing anxiety. It appears that test anxiety heightens when students

enroll in a course where there is only midterm and final test. The reason being that if a student fails or does poorly on the midterm test, then an outstanding performance on the final test is his or her only chance of passing (Leavitt, 2010) which will lead to test anxiety and distress. However, when multiple smaller (frequent) tests are deployed, each counting towards the final grade, there is a considerable potential of reducing test anxiety (Holmes, 2015).

2.4 Level of Retention of Concepts Taught

The very life of schools and universities is based on the assumption that people can gain and maintain information for future reproduction. Knowledge acquisition and retention is generally considered complete when a student can provide the correct answer to a test question. The acquisition and retention of information has been studied in history by encouraging people to study the content over a certain period of time and then test what was actually learned. Testing is probably regarded by many students as an unwanted educational necessity and it appears that most students would prefer to take the fewest possible tests.

However, a study (Abbott, 1909; Dunlosky, Rawson, Marsh, Nathan & Willingham, 2013) revealed that more than 100 years of research has yielded several hundred experiments showing that frequent testing enhances learning and retention. Edward Thorndike recommended that “the active recall of a fact from within is, as a rule, better than its impression from without” (Thorndike, 1906; Dunlosky, Rawson, Marsh, Nathan & Willingham, 2013). Frequent testing, since then has supported Thorndike’s recommendation by demonstrating the broad generalizability of the benefits of frequent testing. Rebecca (2014) opined that frequent testing can actually help students learn information more thoroughly and remember it longer. According this author, Students prefer to study things repeatedly, but when students try to retrieve information by way of testing, whether they get it right or wrong and someone corrects them, they remember things much better on a later test. San (2016), also established that the less one uses a piece of information, the further back in the memory the brain will stuff it, and it may take quite a bit of effort to pull it out again. This implies that if students are tested less frequently they tend to easily forget the concepts being taught and retrieving the information becomes very difficult.

3. MATERIALS AND METHODS

3.1: Study Area and Design

Blakstad (2008) explains research design as a structure of any scientific work comprising steps that are used to collect data. This study adopted action research design because it sets out to unravel the effects of frequent testing on female students’ attitudes (defined as classroom attendance, study habits, anxiety and knowledge retention in Physics) in the Senior High Schools.

3.2: Sample and Sampling Procedure

The population for the study was all science students of AGSHS in the Greater Accra Metropolis. The sample population for this study was restricted to second year female Physics students in AGSHS. The sample was selected using simple random technique. The sample size of 50 respondents is considered adequate to represent the characteristics of the entire population. The validity of any study is based on the systematic method of data collection and analysis. The present study is action research design, based on survey method.

3.3: Data Collection Instruments

Eighteen items comprising a 3-points Likert scale type of questionnaire ranging from 1(disagree) to 3 (agree) based on Oliver’s (1997) study were used to measure the perceptions

students hold about frequent testing on their attendance, study habits, anxiety and knowledge retention. Quality control measures and protocol such as the need for independent completion of the questionnaires and freedom of participation or withdrawal from the study were strictly followed. Special efforts were also made to minimize methodological, personal and social desirability biases.

3.3: Data Collection Procedure

The questionnaires were administered to 50 randomly selected female students in their classrooms. Students were invited to respond to questionnaire statements by picking an option on a 3-point Likert-type scale rating, ranging from disagree through neutral to agree. The questionnaires were administered after one of the researchers taught some selected physics concepts for six weeks.

4. DATA ANALYSIS

The data collected were first analysed using frequency and percentages distribution of responses. The response frequencies of students on a particular stand for each item is presented outside the parenthesis, whilst the percentage responses of students are put in the parenthesis. Descriptive statistics such as mean, standard deviation, ANOVA test and chi-square test of association with $p < 0.05$ were conducted to measure students' perception. The p-value of less than 0.05 was used to gauge whether the difference in mean score for each student was statistically significant. The mean value and SD for each item was determined to give the overall picture of general perception of the students on effects of frequent testing on their attendance, anxiety, study habits and knowledge retention.

RESULTS

The results of the study are presented in Tables 1 and 2 below.

Table 1: Summary Results of Descriptive Statistics and Hypotheses Tested on Effects of Frequent Testing

Research Questions and Constructs	Frequency/Percentage Distributions of Responses			Descriptive Statistics: N=50		Hypotheses Tested (T-Test)	
	Disagree	Neutral	Agree	Mean	SD±	p	Decision
Research Question 1. What are the perceived effects of frequent testing on female students' class attendance?							
I attend more class sessions when frequently scheduled tests are practiced.	0(0)	0(0)	50(100)	3.8200	1.35870	.000	Supported
Frequent tests cause higher level of attendance among students.	0(0)	0(0)	50(100)	3.7000	1.37437	.000	Supported
I will still care about attendance even if there were no frequent tests.	0(0)	0(0)	50(0)	3.9600	1.24657	.000	Supported
Frequent tests discourages students from attending class.	0(0)	0(0)	50(0)	2.5900	1.52484	.000	Supported
Research Question 2 What are the perceived effects of frequent testing on female students' study habits?							
Frequent tests help students develop clear criteria for good learning practices.	5(10)	7(14)	38(76)	4.2100	1.03763	.000	Supported
Frequent tests prepare students to study well for examination.	3(6)	7(14)	40(80)	4.4100	.87727	.000	Supported
Frequent tests serve as a trigger to regular studies.	3(6)	3(6)	44(88)	4.1500	.99874	.000	Supported

Frequent tests create an environment helpful for students to complete assignment task.	7(14)	5(10)	38(76)	3.9100	1.18998	.000	Supported
Feedback from frequent tests help students adjust their study habits.	1(2)	15(30)	34(68)	4.1700	1.08297	.059	Rejected
Research Question 3 What are the perceived effects of frequent testing on female students' anxiety?							
	Disagree	Neutral	Agree	Mean	SD	p	Decision
I experience more anxiety in only mid-term and final tests.	5(10)	15(30)	30(60)	3.0300	1.36667	.258	Rejected
I feel less anxious about mid-term and end of semester exams.	30(60)	15(30)	5(10)	3.1100	1.39186	.000	Supported
I feel more comfortable, relaxed and prepared for any examination.	3(6)	7(14)	40(80)	3.8500	1.26631	.000	Supported
I am more confident in courses with frequent tests than courses with fewer tests.	10(20)	0(0)	40(80)	3.4100	1.45710	.064	Rejected
I am always under pressure at the mere mention of tests.	10(20)	15(30)	25(50)	2.7700	1.48973	.000	Supported
Research Question 4 What are the perceived effects of frequent testing on female students' retention of Concepts							
	Disagree	Neutral	Agree	Mean	SD	p	Decision
Frequent tests improve transfer of knowledge to new contexts.	3(6)	3(6)	44(88)	3.8600	1.27144	.000	Supported
Frequent tests facilitate the retrieval of materials that were not tested.	3(6)	7(14)	40(80)	3.8100	1.10732	.000	Supported
Frequent tests produce better organization of knowledge.	10(20)	15(30)	25(50)	3.8200	1.23403	.000	Supported
Frequent tests enhance direct critical thinking skills	3(6)	10(20)	37(74)	3.8600	1.23926	.000	Supported

Table 2 described summary results of descriptive statistics and hypotheses tested on effects of frequent testing on students' attendance, study habit, anxiety and knowledge retention.

Table 2: One Way ANOVA Results of Students Perception of Frequent Testing

Constructs	Sum of Squares	df	Mean Square	F	p-value
▪ Frequent tests cause higher level of attendance**	33.309	4	8.327	5.147	.001
▪ I will still care about attendance even if there were no frequent tests.	8.212	4	2.053	1.339	.261
▪ Frequent tests discourages students from attending class.	1.333	4	.333	.138	.968
▪ Frequent tests help students develop clear criteria for good learning practices**	15.699	4	3.925	4.102	.004
▪ Frequent tests prepare students to study well for examination	15.161	4	3.790	5.900	.000
▪ Frequent tests serve as a trigger to regular studies	2.186	4	.547	.538	.708
▪ Frequent tests create an environment helpful for students to complete assignment task**	17.819	4	4.455	3.458	.011
▪ Feedback from frequent tests help students adjust their study habits	2.618	4	.655	.548	.701
▪ I experience more anxiety in only mid-term and final tests	3.417	4	.854	.447	.774
▪ I feel less anxious about mid-term and end of semester exams	5.135	4	1.284	.653	.626
▪ I feel more comfortable, relaxed and prepared for any examination	8.059	4	2.015	1.270	.287
▪ I am more confident in courses with frequent tests than courses with fewer tests	7.371	4	1.843	.863	.489
▪ I am always under pressure at the mere mention of tests	2.313	4	.578	.253	.907

▪ Frequent tests improve transfer of knowledge to new contexts**	24.583	4	6.146	4.310	.003
▪ Frequent tests facilitate the retrieval of materials that were not tested	10.651	4	2.663	2.284	.066
▪ Frequent tests enhance direct critical thinking skills	10.291	4	2.573	1.724	.151
▪ Frequent tests produce better organization of knowledge	7.830	4	1.958	1.301	.275

According to the data in Table 2, there were significant differences between the variables indicated with asterisk (**).

DISCUSSION

The study investigated the perception of effect of frequent testing on female students' attitudes. The attitudes in this study refers to students' attendance, study habit, anxiety and knowledge retention. These four characteristics of students were measured using a 3-point Likert-type scale questionnaire ranging from 1 (disagree) through neutral to 3 (agree) with a neutral position of 2.00. The discussion is conducted based on these four thematic characteristics.

7.1 Students Perception of Effects of Frequent Tests on Attendance

A greater understanding of the benefits of taking frequent test can serve to defuse some of the negative perceptions students have on frequent test. For instance, from Table 1, majority of students agreed (mean value: 3.8200, SD = \pm 1.35870) to the fact that they attend more class sessions when frequently scheduled tests are practiced. This perceived effect of frequent test on attendance by students is in line with Carey's assertion in 2013. Carey found that grading students on test, given at the beginning of every class, rather than in midterms or a final test increases attendance (Carey, 2013). One main technique, according to Sheridan (2012) to improving students' classroom attendance is the use of unannounced frequent test. This, the author explained, will encourage students not only to study for each class and have basic understanding of concepts but will also boost class attendance especially when it is made clear that the quizzes cannot be made up later by absent students. This is evident on Table 1 with majority of students who agreed (mean value: 3.700, SD = \pm 1.37437, $P < 0.05$) that frequent tests cause higher level of attendance. This perception from students mirrors the findings of Wilder, Flood and Stromsness (2001) who posited that frequent tests increase students' attendance by 10 percent and Zarie (2015) also revealed that frequent tests lead to fewer absences from class.

Weimer (2010) revealed that consistent findings have shown student attitudes are more positive towards the course and instructor when they are given frequent test. It is therefore, not surprising students will still care (mean value: 3.9600, SD = \pm 1.24657) about attendance even if there were no frequent tests. Weimer therefore, concluded that more tests and quizzes would result in better attendance in class. Smith and Weinstein (2016) also added that in a class where tests are frequent, students need to be in class in order to take the test. This they said would increase classroom attendance and may be more relevant to high schools where attendance may be a problem.

Nevertheless, data captured on Table 1, research question1, item four, there seem to be a disconnect between assertions made by the above mentioned authors (Weimer, 2010 and Smith & Weinstein, 2016) and the perception students hold on attendance as far as frequent testing is concerned. There appears to be a high level of agreement (mean value: 2.5900, SD = \pm 1.52484) to the fact that frequent tests discourage students from attending class. This

could probably be as a result of the unwarranted reputation tests have assumed and the embodiment of all that is wrong with education as posited by Lahey (2014).

7.2 Students Perceived Effects of Frequent Tests on Study Habits

From the data presented in Table 1, it is obvious that there is statistically significant difference in agreement among students in all the constructs found under study habit, with majority of students who agreed (mean value: 4.2100, $SD = \pm 1.03763$, $p < 0.05$) to the fact that frequent tests help students develop clear criteria for good learning practices. This finding is in line with Gibbs and Simpson (2004), who reported that developing a criterion for good learning practice is strongly influenced by frequent tests. For example, students learn in ways that reflect how they think they will be tested, explaining further, Davis (2009) posited that if students expect an exam to focus on facts, they will memorize details, if they expect a test that will require problem solving or integrating knowledge, they will work toward understanding and applying information. It is likely students believe that with a good study habit such as developing a criterion it will prepare them well for final exam. This is because majority of students (mean value: 4.4100, $SD = \pm 0.87727$, $p < 0.05$) agreed to the fact that tests prepare students to study well for examinations. This finding conforms to the assertion that students will study more if they are tested regularly and will space their studying throughout the term rather than concentrating just before the exam (Lemming, 2002). On the other hand, Gooblar (2014) also pointed out that frequent test ensures students are studying regularly throughout the term and not waiting till just before the final exam.

Almost all students agreed (mean value: 4.1500, $SD = \pm 0.99874$) to the fact that frequent testing serves as a trigger to study regularly. Similar finding was made in a study by Kang (2010) who indicated that frequent testing serves as a strategy to help students learn regularly and even space out their studies. Notwithstanding, frequent tests create an environment helpful for students to complete assignment task (mean value: 3.9100, $SD = \pm 1.18998$, $p < 0.05$). Similarly, in Table 1 majority of students appeared to suggest that they prefer having frequent test perhaps because it provides them with more feedbacks to adjust their study habits (mean value: 4.1700, $SD = \pm 1.08297$). This finding was also observed by Hattie and Timpeley (2007) who asserted that frequent tests and its resulting feedback could contribute immensely to improving learning processes.

In addition, Kulik and Kulik (2013) opined that testing with feedback produces the strongest positive effect on achievement, adding stakes or frequency also strongly and positively affects achievement (Phelps, 2012).

7.3 Students Perceived Effects of Frequent Tests on Anxiety

With a neutral position of 2.00, almost all items captured on table 1 under research question 3 received a positive response from majority of students. This is evident in Table 1 (mean value: 3.0300, $SD = \pm 1.36667$). Students' choice of response is in step with Leavitt's assertion that test anxiety heightens when students enroll in a course where there is only midterm and final test. This is because if a student fails or does poorly on the midterm test, then an outstanding performance on the final test is his or her only chance of passing (Leavitt, 2010), hence the increase in anxiety. Holmes supported Leavitt's assertion by adding that when multiple smaller (frequent) tests are deployed, each counting towards the final grade, there is a considerable potential of reducing test anxiety (Holmes, 2015).

For many students, test-taking can be frightening, confusing and nerve - wracking and as a result many students wish for a complete cancelation or a cut down or an alternate ways of

assessing students' in order to have the school environment to be more relaxed and anxiety-free. Inasmuch as many are craving for such atmosphere (less test taking atmosphere), many are also of the view that fewer test taking in a course will never make them feel less anxious, therefore, students must be tested more and not less (Lahey, 2014). This is clearly shown in Table 1 (mean value: 3.1100, SD = ± 1.39186) with majority of students who agreed with that statement. It appears from their response that students have come to realise that the more they are tested (say, once a week or even every class period), they will study more and will space their studying throughout the term rather than concentrating it just before the exam (Lemming, 2002). To avoid distress, cramming and test anxiety, Gooblar (2014) also pointed out that frequent test must be encouraged to ensure that students are studying regularly throughout the term and not waiting till just before the final exams. Similar finding was made in a study by Kang (2010) who indicated that frequent test serves as a good strategy to help students learn regularly and even space out their studies.

Notwithstanding, frequent test make students feel more comfortable, relaxed and prepared for any examination (mean value: 3.500, SD = ± 1.26631) and also more confident in a course with regular test than courses with fewer tests as expressed by students in Table 1 (mean value: 3.4100, SD = ± 1.45710).

Interestingly, quite a number of students agreed (mean value: 2.7700, SD = ± 1.48973) to the fact that they are always under pressure at the mere mention of tests as indicated in Table 1. Perhaps this could be as result of the unwarranted reputation tests have assumed and the embodiment of all that is wrong with education as posited by Lahey (Lahey, 2014).

7.4 Students Perceived Effects of Frequent Tests on Knowledge Retention

A high level of agreement was recorded in all the items found under research question 4 (Table 1). Transfer of knowledge is significantly improved with the help of frequent test as indicated in Tables 1 and 2 (mean=3.8600, SD = ± 1.27144 , $p < 0.05$). Roediger and Karpicke (2006) conducted an experiment, and in their experiment confirmed that if students are frequently tested on concepts and successfully recall or recognize them, they would remember it better and transfer in future than if they had not been tested. In addition, San (2016) posited that the less one uses a piece of information, the further back in the memory the brain will stuff it and it will take quite a bit of effort to pull it out for transfer, hence he need for frequent testing.

Retrieval of materials from the memory to a large extent depend on how often students are tested on those materials. Majority of students' response from Table 1 indicates a high level of agreement (mean value: 3.8100, SD = ± 1.10732). This perception of students about frequent test significantly mirrors the evidence that frequent tests enhance learning, advancing further, Brame and Biel (2015) revealed that frequent testing is the process of remembering concepts or facts, retrieving them from memory in order to increase long term retention of those concepts or facts. Research in cognitive psychology suggests that retrieving information from the memory seems to greatly enhance future recall (Larsen, Butler & Roediger, 2008). According to these authors, this retrieval practice often takes the form of frequent tests.

Many good reasons exist to expect frequent testing to benefit both teaching and learning. For instance, in their investigation, Walvoord and Anderson (2010) found that frequent tests encourage the kind of thinking that is essential not just for retention but also for mentally organizing the acquisition of new materials. It is therefore, not surprising from Table 1 that majority of students agreed (mean value: 3.8200, SD = ± 1.23403) to the assertion by these authors. In addition, frequent test encourages students to study not only focusing on test but

would also provide feedback to instructors, improves metacognitive monitoring and moreover, produce better organization of knowledge (Roediger, Putman & Megan, 2011).

Thus far, we have only considered how frequent tests benefit students to remember concepts. Of course, remembering what is taught is only a small part of the process of becoming educated in a discipline. Being able to think critically and draw inferences on the basis of learned concepts is important. Critical thinking can be defined as a more complex and significantly demanding logic form of higher-order reasoning (Almeida & Franco, 2011). Majority of students agreed (mean value: 3.8600, SD = \pm 1.23926) to the fact that frequent tests enhance direct critical thinking skills.

8. CONCLUSION

In conclusion, the study found that frequent testing has statistically significance positive effects on Senior High School Female Students' classroom attendance, study habits, anxiety and knowledge retention in Physics. This result provided relevant information needed by science educators to enhance female students' interests and habits in learning science, especially physics as a component of science.

9. Recommendations for Instruction

The study recommends that Physics educators should adopt frequent testing measures to bring positive effects on Senior High School Female Students attitudes in Physics.

Conflicting Interests

The authors have not declared any conflict of interests.

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